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A BOTANICALLY REMARKABLE LOCALITY IN THE
TALLAHASSEE RED HILLS OF MIDDLE FLORIDA

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At the time of the publication of my *Geography and Vegetation of Northern Florida*, late in 1914,* automobiles were rather a scarce luxury, and exploring by means of horse and buggy was but little better than walking, and my observations in the region designated as the Tallahassee red hills were practically confined to what I could see in walking out from Tallahassee and back the same day, a radius of ten or twelve miles.† Consequently I had never seen Lake Miccosukee, one of the four large shallow lakes of the region, which is about twenty miles northeast of Tallahassee.

In the work cited (page 277) I mentioned the remarkable dearth of rare plants in this region, a region which has no counterpart anywhere else in the world, and ought presumably therefore to have at least a few endemic plants. That statement now requires modification.

Early in January, 1924, I returned to Tallahassee after one of my periodic absences in other states, and found the post of assistant professor of botany at the Florida State College for Women occupied by Dr. Herman Kurz, who possessed an automobile and a fondness for exploring the surrounding country with it. I soon went on trips with him to various places which had previously been out of my reach; and on Monday afternoon, February 18th,‡ we headed for Lake Miccosukee. Dr. Kurz

* *Ann. Rep. Fla. Geol. Survey*, 6: 167-437.

† Miss Laura Gano, who studied the vegetation of this neighborhood between 1908 and 1910, and published an account of it in the *Botanical Gazette* several years later (63: 337-372. 1917), was probably even more restricted in her explorations, and did not do justice to any of the large lakes.

‡ Not Sunday as stated in a Science Service news item in *Science* for Oct. 10, 1924 (and copied in the *Literary Digest* for Nov. 15). That item seems to have been written by a friend of Dr. Kurz's, who was in Florida at the time of the discovery here described, and had some inside information as well as a little misinformation. (This correction is made for the benefit of the "fundamentalists" and others who might think there was something reprehensible about discovering new species on Sunday.)

had previously been to the west side of the lake, and thought the woods on the other side looked interesting from the distance; so at his suggestion we went around to the northeast side to see what we could find.

Lake Miccosukee is roughly triangular in shape, with an area of about eight square miles, and is all in Jefferson County, but its western shore forms part of the boundary between the counties of Leon and Jefferson. The road we followed ended at a duck-hunter's boat-house known as Dogwood Landing, on the northeast side of the lake about two miles from its north-west corner, and five miles south of the Georgia line. This lake, like others of its class, is shallow enough for maiden cane (*Panicum hemitomon*), various Nymphaeaceae, and other aquatics to grow nearly all over it, and at times it is almost completely dry.* The shallowness of the water, combined with the vegetation, checks wave action and prevents the formation of sandy beaches.

At the point where we first stopped the shore is low, miry, and ill-defined, and bordered by scattered cypress trees, *Taxodium distichum*, which had not been reported from this region before.† With the cypress, or a little farther back from the water but still in miry ground, are the following plants, besides others not easily identifiable when leafless. (They are arranged in approximate order of abundance.)

TREES:—*Acer rubrum*, *Liquidambar*, *Diospyros*, *Quercus nigra*, *Q. Michauxii*, *Melia Azedarach* (introduced), *Celtis* sp., *Salix nigra*.

SHRUBS:—*Cephalanthus*, *Cyrilla racemiflora*, *Styrax Americana*.

WOODY VINES:—*Tecoma radicans*, *Ampelopsis arborea*, *Rhus radicans*, *Parthenocissus*, *Vitis aestivalis* (?), *Bignonia crucigera*.

HERBS:—*Tillandsia usneoides*, *Hibiscus* sp., *Pontederia*.

A little farther southeast along the lake shore, say half a mile from Dogwood Landing, the land rises more steeply from the lake, forming a low bluff or slope perhaps twenty feet high, with a horizontal distance of 100 to 200 feet from the top of the bluff to the edge of the water; and that continues for another

* See E. H. Sellards, Ann. Rep. Fla. Geol. Surv. 3: 58-61, pl. 6: 6: 130-133, 137; 9: 124-127, pl. 8.

† In Lake Lafayette there is an abundance of cypress, but it seems to be all *T. imbricarium*.

half mile if not farther. From the top of the bluff cultivated and abandoned fields and groves of second-growth pines (mostly *Pinus echinata*) extend northward for an indefinite distance; but the slopes are still wooded with what appears to be virgin forest, except for an occasional chinaberry tree (*Melia*), which sometimes invades rich woods in the South much as *Prunus Avium* does around New York.



Looking southeast along shore of Lake Miccosukee near Dogwood Landing, showing *Pontederia* and *Panicum hemitomon* in foreground, *Taxodium distichum* at left, and wooded bluff in distance. 4:03 p.m., Feb. 18, 1924.

Although the vegetation of the lake shores and bluff includes several species that are rather fond of limestone (such as *Taxodium distichum*, *Ampelopsis arborea*, *Quercus Schneckii*, *Tilia*, *Acer Floridanum*, *Ulmus fulva*, *Cercis*, *Adelia ligustrina*, *Ptelea*, *Arisaema Dracontium*, *Tovara*, *Spigelia*, *Polymnia Uvedalia*, and *Eupatorium incarnatum*), no rock of any kind was seen on the northeast side of the lake, and several borings made on the wooded slope with a three-foot auger by Dr. Kurz revealed

nothing but sandy red clay with a slightly acid reaction, much the same as can be seen on almost any hillside in this whole region. (A chemical analysis might tell a different story, but that has not been possible yet.) Some of the plants also are rather partial to river-banks (e.g., *Taxodium*, *Celtis*, *Salix*, *Calyocarpum*), but we have no evidence that Lake Miccosukee was ever connected with any river. The forest is pretty well protected from fire by the slope of the bluff with water at its base, and there is considerable humus in the soil, but that alone would not account for the luxuriance of the vegetation and the predominance of deciduous trees.* If it were not for the presence of the Spanish moss, *Tillandsia usneoides*, any one entering this forest in twilight could easily imagine himself to be somewhere in Ohio or Kentucky.

On account of the very interesting vegetation, and especially one plant which will be referred to more particularly below, I made four more visits to the place in 1924, in March, April, May and December. Being out of the state from the middle of May† to the first of November, I had no opportunity to study the summer and fall flora, and have probably missed a few species that are not recognizable in winter and spring. But such an opportunity cannot be counted on this year either, so it seems desirable to place on record some of the facts about this very interesting locality without waiting for a more complete list of plants.

The following list applies only to the wooded bluff slopes on the northeast side of the lake, and not to those on the west side‡ or to the miry lake shores, which have already been discussed. The plants are divided into large trees, small trees, woody vines, shrubs, and herbs, and arranged as nearly as possible in order of abundance in each group. Evergreens are indicated by heavy type, and introduced species by parentheses.

* See Bull. Torrey Club 41: 218-219. 1914.

† See Torreya 24: 77-83. Oct. 1924.

‡ The sink or subterranean outlet of the lake, which is on the west side about opposite Dogwood Landing, was visited by the writer with Dr. Kurz and Mr. Coville on March 2, 1924, and found to be at the foot of a steep wooded bluff, but on and around this bluff we saw practically no lime-loving or other specially noteworthy plants, and the flora was about the same as in any moderately rich woods in the Tallahassee red hills.

LARGE TREES

Quercus Schneckii (?)	Prunus serotina
Quercus Michauxii	Celtis sp.
Liquidambar Styraciflua	(Melia Azedarach)
Tilia sp.*	Quercus Virginiana
Fraxinus Americana	Hicoria sp.
Acer Floridanum	Pinus Taeda
Ulmus fulva	Magnolia grandiflora
Ulmus alata	

SMALL TREES

Prunus Caroliniana	Persea Borbonia
Cercis Canadensis	Morus rubra
Ilex opaca	

WOODY VINES

Bignonia crucigera	Rhus radicans
Parthenocissus quinquefolia	Vitis rotundifolia
Smilax rotundifolia ?	Smilax lanceolata

SHRUBS

Grossularia echinella	Callicarpa Americana
Adelia ligustrina	Ptelea trifoliata
Aesculus Pavia	Asimina parviflora

HERBS

Tovara Virginiana	Polymnia Uvedalia
Calyocarpum Lyoni	Oplismenus setarius
Tillandsia usneoides	Eupatorium incarnatum
Arisaema Dracontium	Polypodium polypodioides
Spigelia Marilandica	Trillium Underwoodii
Tradescantia sp.	

The most remarkable thing about the vegetation (disregarding the identity of the species) is the fact that the first evergreen tree comes twelfth on the list, and there seem to be no evergreen

* In the last few years, since the splitters have been at work on this genus, it is practically impossible to identify the described forms in the field without a manual, or in winter even with a manual (much as in *Crataegus*). They all have much the same bark, wood, flowers and habitat, and the 15 alleged species and several varieties described in the 1922 edition of Sargent's Manual of North American trees are distinguished mainly by the pubescence and serration of the leaves. The 17 *Tilia* cuts in that work do not show any important differences, and there is possibly no one who could identify them all if they were separated from the accompanying text. Such forms cannot be distinct species in the same sense as those of *Pinus*, *Quercus*, etc., now commonly recognized.

shrubs. There are more evergreens among the small trees and vines, but it is probably safe to say that not one-tenth of the vegetation is evergreen; which can hardly be said of any other equal area in Florida, outside of the alluvial bottoms of the Apalachicola River. Elsewhere I have found a correlation between scarcity of evergreens and abundance of potassium compounds in the soil,* but whether or not that will hold here we have no direct evidence yet.

Neither Ericaceae nor Leguminosae were observed, for the former seem to avoid lime and potash and the latter humus; but some of the latter might possibly be found in summer. Until a more complete list of plants is available it is hardly worth while to discuss the families most largely represented, the prevailing flowering seasons, colors of flowers, modes of dissemination, etc.

Taxodium distichum, *Ulmus fulva*, *Adelia*, *Ptelea*, *Tovara*, and *Calyccarpum* had not been reported from this region before, but most of them can be found on the Apalachicola River bluffs or in the Marianna red lands farther west. By far the most interesting plant in the list is *Grossularia echinella*. Although it is more abundant in the area under consideration than all the other shrubs combined, it is not known anywhere else in the world, and not described in any book; and therefore some particulars about the circumstances under which it was found will be of interest.

Soon after entering the rich woods southeast of Dogwood Landing with Dr. Kurz on the date named (Feb. 18, 1924) I was surprised to see a few specimens of a currant or gooseberry (both of which were formerly included in the genus *Ribes*). Although no such plant had been found anywhere near Florida before, at first it did not occur to me that it might be an undescribed species, and I was inclined to refer it to *Ribes* (*Grossularia*) *curvatum* Small, whose nearest known stations were Stone Mountain, Georgia, and the mountains of Alabama, over 200 miles away and in a perceptibly cooler climate. Its leaves were then about half grown, and we guessed that it would be in bloom about two weeks later. As the afternoon was then well advanced, we did not go more than a quarter of a mile or so into the forest after finding the first specimens of the gooseberry,

* See Bull. Torrey Club 40: 398-399. 1913.

but the farther we went the more abundant it became; and in May, about half a mile farther in the same direction, we found at least an acre in deep woods a little farther from the lake so densely covered with the same plant that it was difficult to walk through without tearing one's clothes on the sharp thorns.



Rich woods on northeast side of Lake Miccosukee about one-half mile southeast of Dogwood Landing, showing *Fraxinus Americana*, *Quercus Schneekii*, etc. 4:28 p.m., March 2, 1924. *Grossularia echinella* occurs near by, but does not happen to appear in this view. Note the scarcity of shrubs and evergreens. It is interesting to compare this with fig. 5 in Geol. Surv. Ala Monog. 8 (1913), taken on a limestone slope in the Tennessee Valley, and fig. 42 in 6th Ann. Rep. Fla. Geol. Surv. (1914), taken on a limestone slope in West Florida. All three pictures were taken in March, when most of the trees were leafless, and a few plants are common to all three places.

On February 29th Mr. F. V. Coville arrived in Tallahassee for a brief visit on his way to West Florida, and as he had done considerable work with the Grossulariaceae I told him of our find, and of our plans to visit the place again soon to look for flowers, and he readily accepted an invitation to go along. On March 2nd we revisited the spot and found the gooseberry in bloom,

and Mr. Coville almost immediately pronounced it a new species. (He described it as soon as possible thereafter,* without even waiting to learn the color and taste of the ripe fruit which was not available until June.) Dr. Kurz and Mr. Coville went there again about four weeks later, and on April 22nd I conducted Dr. John K. Small and his party to the spot, and



Looking across a slough near Lake Miccosukee about $\frac{3}{4}$ mile southeast of Dogwood Landing. Trees in foreground mostly *Fraxinus lanceolata* (?). On slightly higher ground just beyond can be seen the edge of a dense mass of *Grossularia echinella* covering an acre or more. 5:40 p.m., May 10, 1924.

found the fruit about two-thirds grown. Dr. Kurz took Dr. Frank Thone and two entomologists from the University of Florida there on April 27th, and me again on May 10th, and Mr. Coville went to the place from Thomasville, Ga., late in June to get the ripe fruit. Dr. Kurz was there again in October, and he and I together on December 15th.

* Jour. Agric. Research 28: 71-74, pl. 1. "April 5" [June] 1924. If the specific name is a substantive it should be written *Echinella*; and if it is an adjective those who do not separate *Grossularia* from *Ribes* will write it *echinellum*.

Some weeks before *Grossularia echinella* was formally described, news of the discovery got into several Florida newspapers, and led many people to imagine that because it was something new it must necessarily be valuable (unmindful of the fact that nearly all our food plants have been known for centuries, and we did not even know at that time whether this gooseberry was edible or not). This brought several requests from perfect strangers for living plants, but naturally we did not care to make such a long journey to accommodate them, and incidentally contribute to the extermination of a very rare plant before it was even named. Several people also bobbed up with stories of gooseberries they had seen in other places not far away, but all such reports proved to pertain to the genus *Polycodium* (Vacciniaceae), the species of which are commonly known as gooseberry in the South.

A brief description of *Grossularia echinella* may be of interest to readers who do not have access to Mr. Coville's publication. It is a shrub three or four feet tall when full grown, with slender arched stems which often take root where they touch the ground. The leaves are much like those usual in the genera *Grossularia* and *Ribes*, (palmately lobed, as in several other families of Polypetalae), and there is a pair of sharp stipular spines at every node. The ovary, calyx-tube or hypanthium (as it is variously interpreted) when in flower is densely covered with soft green spines, which as the fruit develops become larger and farther apart, but hardly stiff enough to cause serious discomfort if one wishes to bite into the berry. When full grown the berry is about an inch in diameter, and somewhat intermediate in appearance between a small chestnut burr and a green jimson weed pod. It is the largest and spiniest of any American species of the genus. The spines number perhaps two or three hundred to the fruit, and are gland-tipped.

Another peculiarity of this species is its leaf development. According to Dr. Kurz, when he visited the place last October the bushes were practically leafless, but new leaves were just beginning to show. At the middle of December they were flattened out and approximately half grown, just as they were in February. So apparently the leaves remain half developed through the winter and complete their growth in spring, unlike any other deciduous shrub known to me. Just what effect a

severe freeze has on them remains to be seen. At the time of the first discovery it was just six weeks after a minimum temperature of about 16° F. in Tallahassee, which killed many cultivated woody plants to the ground; and it is possible that the leaves we first saw had all come out since that freeze.

The inhabitants within several miles of the place seem to be all negroes, and we have not yet heard that any of them know any name or use for *Grossularia echinella*, although according to Mr. Coville its fruit is sweet and juicy. *But we have not talked about it much locally, for fear of giving the impression that it is something valuable and thus causing a raid on it. Several specimens that have been transplanted to yards in Tallahassee are growing nicely.

TALLAHASSEE, FLORIDA.

FURTHER NOTES ON CALYPSO

HENRY MOUSLEY

I have found an Orchis:
 "What of that?" you say,
 T'is a proof that miracles
 Happen every day.

The above lines, I believe, are attributable to Mrs. Talbot Clifton, the authoress of "Pilgrims To The Isles of Penance," "Orchid gathering in the East", or as it was to have been called, "The Orchid Pilgrimage," and I have chosen them as being a somewhat appropriate heading to this further paper on the underground development of Calypso. In my first article on the subject—see the "Journal of the New York Botanical Garden" for February 1924—it seemed to me that I had covered the ground fairly well, but even after years of patient research, it is no surprise to the orchid hunter to find new wonders awaiting him, not only above, but below ground also. It is in the study of the latter phase more especially, that I am meeting with new

* SUPPLEMENTARY NOTE. Dr. Kurz visited the locality on June 2, 1924, a few days before leaving Florida for the summer, and found the gooseberries not quite ripe. But Mrs. Kurz gathered some of them, and the next morning made from them some jelly, which in both color and taste was very similar to apple jelly.